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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HOFFMANN & BARON, LLP 6900 JERICHO TURNPIKE SYOSSET, NY 11791			EXAMINER VAN OUDENAREN, SARAH A	
			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,010	Applicant(s) SIJPKES ET AL.	
	Examiner SARAH VAN OUDENAREN	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 13-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 13-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/26/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 6-8, 10-11, and 13 are rejected under 35 U.S.C. 103(a) as being obvious over Satoru et al (EP 0 895 809) in view of Shaw et al (US 4,280,929).

Satoru teaches a Nb containing catalyst which can be used for the production of (meth)acrylic acid or (meth)acrylonitrile in high yield. The active elements of the catalyst are Nb, Mo, V, and Te (pg 6, lines 15-20). The catalyst may further comprise a carrier which may be silica, alumina, titania, magnesia, or zirconia (pg 13, lines 5-15). An aqueous compound mixture is made with Nb and solutions of the other active elements and can have the carrier as well. It is usually obtained in the form of a slurry. The aqueous mixture is then spray dried at a temperature of 150-300°C. (pg 13, lines 30-58). The dried particulate catalyst can be heat treated in an atmosphere of air at a temperature of 200-400°C and then calcined in an atmosphere of inert gas at a temperature of 500-700°C (pg 14, lines 1-15).

Satoru does not explicitly teach the use of a ceramic in the form of a dry powder as the carrier.

Shaw teaches a multi-component oxide catalyst known to be useful in the oxidation of olefins to oxygenated hydrocarbons. Examples of these reactions are the

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oxidation of isobutylene to methacrolein (col 1, lines 5-15). Shaw teaches that it has been discovered the use of fumed silica in catalyst preparation followed by an addition of silica results in a catalyst having better physical strength for operation and greater activity and selectivity than the prior art supported catalyst (col 1, lines 40-45). Shaw identified prior art carriers to be silica sol (col 1, lines 30-35). Shaw further teaches fumed silica should be well mixed with the active components in a slurry before drying and the fumed silica should be 5-95% of the total silica used (col 2, lines 40-50). It is noted that fumed silica is considered by examiner to be a dry powder.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the fumed silica of Shaw with the catalyst of Satoru as the addition of the fumed silica would produce a catalyst with better physical strength for operation and greater activity and selectivity.

Regarding claim 2, Satoru teaches the aqueous mixture being spray dried at a temperature of 150-300°C (pg 13, lines 50-55).

Regarding claim 3, Satoru teaches the calcining taking place in an inert atmosphere where the inert gas is nitrogen or argon (pg 14, lines 1-5).

Regarding claim 6, Satoru's method obtains a catalyst which has active ingredients of Nb, Mo, V, and Te (pg 12, lines 45-55).

Regarding claim 13, Satoru teaches utilizing silica (pg 13, lines 5-15) and Shaw teaches utilizing fumed silica as the inert carrier (col 1, lines 40-45).

Regarding claims 14, 16, 18, and 20, Satoru teaches (meth)acrylic acid or (meth)acrylonitrile can be produced via oxidation or ammoxidation of propane or isobutene in the presence of the catalyst discussed above (pg 14, lines 5-10).

Regarding claims 15, 17, 19, and 21, Satoru teaches the process can be conducted in a conventional reactor such as a fixed bed reactor (pg 14, lines 10-15).

Claim 4 is rejected under 35 U.S.C. 103(a) as being obvious over Satoru et al (EP 0 895 809) in view of Shaw et al (US 4,280,929) and further as evidenced by Wypych (Handbook of Fillers, 2nd edition, 2000).

Satoru teaches a Nb containing catalyst which can be used for the production of (meth)acrylic acid or (meth)acrylonitrile in high yield. The active elements of the catalyst are Nb, Mo, V, and Te (pg 6, lines 15-20) as discussed above. Satoru does not explicitly teach the use of a powder as the carrier. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the fumed silica of Shaw with the catalyst of Satoru as the addition of the fumed silica would produce a catalyst with better physical strength for operation and greater activity and selectivity, as discussed above.

Satoru nor Shaw explicitly teach the particle size of the carrier. As discussed above, the carrier is substantially fumed silica. Fumed silica has a particle size of 5-40nm as evidenced by Wypych (Section 2.1.51.1 pg 132).

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Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoru et al (EP 0 895 809) as modified by Shaw et al (US 4,280,929) as applied to claims 1 and 6 above, and further in view of Ushikubo (US 5,380,933).

Satoru teaches a Nb containing catalyst which can be used for the production of (meth)acrylic acid or (meth)acrylonitrile in high yield. The active elements of the catalyst are Nb, Mo, V, and Te (pg 6, lines15-20) as discussed above. Satoru does not explicitly teach the use of a powder as the carrier. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the fumed silica of Shaw with the catalyst of Satoru as the addition of the fumed silica would produce a catalyst with better physical strength for operation and greater activity and selectivity.

Satoru does not explicitly teach the preparation of acetic acid by oxidizing ethane.

Ushikubo teaches a method for producing carboxylic acid which subjects an alkane to a vapor phase catalytic oxidation reaction in the presence of a catalyst comprising Mo, V, Te, and Nb (col 1, lines 60-70). The starting material alkane may be ethane (col 5, lines25-35). Ushikubo teaches acetic acid being yielded as a bi-product (col 6, lines 15-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the catalyst of Satoru with the ethane and production of carboxylic acid of Ushikubo as the catalysts utilized are similar and would therefore produce similar products when put under oxidation. Further, as both Ushikubo and Satoru teach

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oxidizing an alkane with their respective catalysts, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any alkane, i.e. ethane.

Regarding claim 12, Satoru teaches the process can be conducted in a conventional reactor such as a fixed bed reactor (pg 14, lines 10-15).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Satoru et al (EP 0 895 809) as modified by Shaw et al (US 4,280,929) as applied to claims 1 and 6 above, and further in view of Han et al (EP 1 358 932).

Satoru teaches a Nb containing catalyst which can be used for the production of (meth)acrylic acid or (meth)acrylonitrile in high yield. The active elements of the catalyst are Nb, Mo, V, and Te (pg 6, lines 15-20) as discussed above. Satoru does not explicitly teach the use of a powder as the carrier. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the fumed silica of Shaw with the catalyst of Satoru as the addition of the fumed silica would produce a catalyst with better physical strength for operation and greater activity and selectivity.

Han teaches a supported catalyst comprising mixed metal oxide. The catalyst comprises Mo, V, Te, and Nb and can be combined with a support (pg 4, lines 45-58) as discussed above. Han further teaches that the material may be converted to a catalyst having higher activities by grinding and then processing it (pg 7, lines 45-50). Han teaches the particle size of the catalyst to be 5-30 mesh (pg 5, lines 1-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to grind the catalyst of Satoru in view of Shaw as taught by Han further as it

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would convert the catalyst to have higher activity. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to further grind the catalyst into an optimal size for the desired end product and/or to be functional during the desired reactive conditions.

Response to Arguments

Applicant's arguments submitted 4/20/2010 have been fully considered but they are not persuasive. Currently the pending claims are 1-6 and 13-23.

The 112 2nd paragraph and 101 rejection over claims 7-12 has been withdrawn as a result of applicant's cancellation of claims 7-12.

Applicant argues that Satoru teaches away from utilizing a carrier-supported catalyst as applicant states that Satoru teaches that although carrier-supported catalysts may be used in the preparation of (meth)acrylic acid and (meth)acrylonitrile, it is likely that the use of a carrier adversely affects the reaction thereby leading to a lowering of the yield of desired products. While such a teaching is noted by examiner, the rejection is maintained insofar as Satoru explicitly teaches a carrier-supported catalyst which is used in the preparation of (meth)acrylic acid and (meth)acrylonitrile. Whether or not a high yield is obtained is immaterial to whether or not Satoru is pertinent art. Further, a specific yield is not required by the instant claim language and as such the rejection over Satoru in view of Shaw is maintained.

Applicant argues that while Shaw teaches catalysts and silica, Shaw does not take the method of the presently claimed invention. Examiner notes that Shaw was

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relied upon only for its teaching a carrier in the form of a ceramic dry powder and for no other methodical step. Examiner utilized the fumed silica of Shaw as a dry powder, however also notes that silica sol is considered to have powdered particles as well, as discussed above. Further, although applicant argues that when the fumed silica is utilized in the catalyst of Shaw, a lower yield is obtained, this again does not impact the patentability of the claims. The rejection is maintained insofar as Shaw explicitly teaches the fumed silica being utilized as a ceramic carrier and is considered by examiner to be a dry powder, as discussed above. The instant claim language does not require a yield.

Applicant argues that examiner does not have motivation to combine Satoru and Shaw insofar as applicant alleges that Satoru teaches away from using any carrier and Shaw teaches away from the use of fumed silica. Examiner disagrees insofar as Satoru explicitly teaches utilizing a carrier and Shaw explicitly teaches utilizing fumed silica as a carrier. Examiner notes that Shaw teaches that the use of fumed silica in catalyst preparation followed by an addition of silica results in a catalyst having better physical strength for operation and greater activity and selectivity than the prior art supported catalyst (col 1, lines 40-45). Shaw identified prior art carriers to be silica sol (col 1, lines 30-35). Shaw further teaches that fumed silica should be well mixed with the active components in a slurry before drying and the fumed silica should be 5-95% of the totally silica used (col 2, lines 40-50). With such teachings in Shaw, examiner disagrees that Shaw teaches away from utilizing fumed silica as a support. It is noted that additional forms of silica are used in combination with the fumed silica, however, the carrier of the instant claim is not limited to fumed silica but merely to a dry powder. Examiner

maintains the rejection. Additionally, rejections over the newly added claims 13-21 have been added over Satoru in view of Shaw.

Applicant argues that Wypych does not relate in any manner to the suitability or unsuitability of certain catalysts or carrier in the oxidation or ammoxidation of alkanes or alkenes. Examiner utilized Wypych as evidence for the particle size of fumed silica, as discussed above. Wypych is not relied upon for any other teaching.

Applicant argues that Ushikubo discloses the preparation of unsaturated carboxylic acids and therefore it cannot relate to the preparation of acetic acid. Further, applicant states that ethane is taught by Ushikubo to be a contaminant. Examiner agrees that the invention of Ushikubo is utilized to prepare carboxylic acids, however, Ushikubo also teaches that acetic acid will be produced as a bi-products during the oxidation of propane (col 6, lines 15-30). Further, Ushikubo teaches that the starting material alkane is not particularly limited and an alkane containing a lower alkane such as ethane may be used without any particular problem (col 5, lines 25-35). Examiner maintains that Ushikubo teaches that ethane can be used as the alkane or at least as a portion of the alkane and oxidized to produce acetic acid. While it is noted the acetic acid produced is only a bi-product, an explicit teaching of a preparation of acetic acid is still considered by examiner to be taught.

Applicant argues that Han teaches that the use of a support exhibits deleterious effects in the process for preparation of acrylic acid and that the use of alumina is seen as the least disadvantageous support. Han is currently relied upon only for the teaching of converting a catalyst having higher activities by grinding and then processing it.

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Further, it is noted above in the rejection over claim 5, it would have been obvious to one of ordinary skill in the art at the time of the invention to further grind the catalyst into an optimal size for the desired end product and/or to be functional during the desired reactive conditions.

Regarding the art previously made of record but not relied upon, applicant argues that both are not analogous as they differ in their catalytic components and method steps. However, examiner maintains that they are to be of record although not relied upon as Grasselli, while teaching a catalyst of different components, teaches a catalyst formed by a single slurry technique using a silica sol and fumed silica support. Although the catalyst is different, the support and single slurry technique are similar. Regarding Hensel, it is taught that the activity of the catalyst can be controlled by varying the weight ratio of the catalyst to the carrier and especially varying the ratio of carrier components with a large and small surface area. While it is noted that Hensel includes a different catalyst, the intended reaction is similar and therefore the activity of the catalyst being controlled may be similar as well.

Regarding the evidence submitted in the form of a declaration by Andre Sijpkens submitted 4/20/2010, examiner considers the evidence submitted not commensurate with the scope of the instant claims as the instant claims are not limited to silica, but rather recite ceramic. Shaw teaches that using fumed silica in catalyst preparation followed by an addition of silica results in a catalyst having better physical strength for operation and greater activity and selectivity than the prior art supported catalyst, thus it is expected that the use of a dry powder such as fumed silica would provide higher

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catalyst activity and selectivity. It is not clear to examiner how the evidence submitted is intended to be read over the rejections of record. If the evidence was to be considered as a part of applicant's arguments over Satoru in view of Shaw, further clarification will be needed by examiner.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH VAN OUDENAREN whose telephone number is (571)270-5838. The examiner can normally be reached on Monday-Thursday, 9:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SARAH VAN OUDENAREN/
Examiner, Art Unit 1793
June 22, 2010

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793